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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/033,925	12/28/2001	Troy Raymond Pesola	2001-094-NSC	2303

7590 04/20/2005
STORAGE TECHNOLOGY CORPORATION
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EXAMINER

THAI, TUAN V

ART UNIT	PAPER NUMBER
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2186

DATE MAILED: 04/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/033,925	Applicant(s) TROY ET AL.	
	Examiner Tuan V. Thai	Art Unit 2186	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 February 2005.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-33 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-33 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Serial Number: 10/033,925

Art Unit: 2186

Part III DETAILED ACTION

Response to Amendment

1. This office action is in response to Applicant's communication filed February 02, 2005. This amendment has been entered and carefully considered. Claims 1-33 remain pending in the application.

2. Applicant's arguments with respect to claims 1-33 have been considered but are deemed to be moot in view of the new grounds of rejection. The finality of the previous office action is hereby withdrawn. Any inconvenience is *SINCERELY* regretted.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

- (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Serial Number: 10/033,925

Art Unit: 2186

4. Claims 1-9 and 12-20 are rejected under 35 U.S.C. 102(e) as being anticipated by LeCrone et al. (USPN: 6,714,430); hereinafter LeCrone.

As per claim 1, LeCrone teaches the invention as claimed including method for managing copies of virtual volume data comprises (e.g. see abstract) comprises receiving an access request directed to an original virtual volume is equivalently taught as receiving I/O requests over a first communication channel to a first plurality of logical (virtual) devices (e.g. see column 12, lines 34-36); mapping the access request to a secondary virtual volume is taught as redirecting (mapping/switching) the I/O requests to the secondary logical devices and performing the access request on one or more physical volumes associated with the secondary virtual volume (e.g. see column 12, lines 7 et seq.; figure 1; column 3, lines 52-55 and column 5, lines 7-36).

As per claim 2, wherein the original virtual volume is associated with one or more original physical volumes, and wherein the one or more original physical volumes are different from the one or more physical volumes (e.g. see column 5, lines 7-12; column 11, lines 33-36); noting that LeCrone discloses storage facilities 204 and 207 can have many different forms (e.g. see column 4, lines 38-39);

As per claim 3, wherein the original virtual volume is

Serial Number: 10/033,925

Art Unit: 2186

associated with one or more original physical volumes, and wherein the one or more original physical volumes are the same as the one or more physical volumes (e.g. see column 5, lines 7-12; column 11, lines 33-36); Lecrone further teaches storage facilities 204 and 207 can have similar structure (e.g. see column 41-43);.

As per claims 4 and 5, the different types of storage media of the physical volumes is taught by Lecrone to the extent that is being claimed since Lecrone discloses storage facilities 204 and 207 can have many different forms wherein the physical storage devices 214, 216 of the local storage facility 204 and 224, 226 of the remote data storage facility 207 can be one of magnetic tape media, magnetic disk media, optical media, floppy diskettes, CD-ROM media, DVD-ROM media, random access memory (RAM), and memory card media as being claimed (e.g. see column 4, lines 38-39);

As per claim 6, wherein mapping the access request to a secondary virtual volume includes redirecting the access request from a first secondary virtual volume to a second secondary virtual volume (e.g. see column 12, lines 7 et seq.; figure 1; column 3, lines 52-55 and column 5, lines 7-36);

As per claim 7, wherein the access request is redirected in response to a fault in a physical volume of the first secondary virtual volume (e.g. see column 11, lines 58-62);

As per claim 8, wherein the access request is redirected in

Serial Number: 10/033,925

Art Unit: 2186

response to a command to redirect the access request to the second secondary virtual volume (e.g. see column 11, lines 52-58);

As per claim 9, the different media types of the physical volumes associated with the virtual/logical volumes is taught by Lecrone since Lecrone clearly discloses data storage facilities 204 and 207 can have many different forms (e.g. see column 4, lines 38-39);

As per claim 12, an apparatus for managing copies of virtual volume data (e.g. see figure 1) comprises means for receiving an access request directed to an original virtual volume is taught as host adapter 210 (e.g. see figure 1; column 4, lines 44 et seq.; column 5, lines 7 et seq. and column 12, lines 34-36); means for mapping the access request to a secondary virtual volume and means for performing the access request on one or more physical volumes associated with the secondary virtual volume are taught as channel 233 and host adapter 234 in the remote data storage facility 207 for redirecting (mapping/ switching) the I/O requests to the secondary logical devices and performing the access request on one or more physical volumes associated with the secondary virtual volume (e.g. see column 12, lines 7 et seq.; figure 1; column 5, lines 24-26; also see column 3, lines 52-55 and column 5, lines 7-36).

As per claim 13, wherein the original virtual volume is associated with one or more original physical volumes, and

Serial Number: 10/033,925

Art Unit: 2186

wherein the one or more original physical volumes are different from the one or more physical volumes (e.g. see column 5, lines 7-12; column 11, lines 33-36); noting that LeCrone discloses storage facilities 204 and 207 can have many different forms (e.g. see column 4, lines 38-39);

As per claim 14, wherein the original virtual volume is associated with one or more original physical volumes, and wherein the one or more original physical volumes are the same as the one or more physical volumes (e.g. see column 5, lines 7-12; column 11, lines 33-36); Lecrone further teaches storage facilities 204 and 207 can have similar structure (e.g. see column 41-43);

As per claims 15 and 16, the different types of storage media of the physical volumes is taught by Lecrone to the extent that is being claimed since Lecrone discloses storage facilities 204 and 207 can have many different forms wherein the physical storage devices 214, 216 of the local storage facility 204 and 224, 226 of the remote data storage facility 207 can be one of magnetic tape media, magnetic disk media, optical media, floppy diskettes, CD-ROM media, DVD-ROM media, random access memory (RAM), and memory card media as being claimed (e.g. see column 4, lines 38-39);

As per claim 17, wherein means for mapping the access request to a secondary virtual volume includes means for redirecting the access request from a first secondary virtual

Serial Number: 10/033,925

Art Unit: 2186

volume to a second secondary virtual volume (e.g. see column 12, lines 7 et seq.; figure 1; column 3, lines 52-55 and column 5, lines 7-36);

As per claim 18, wherein the access request is redirected in response to a fault in a physical volume of the first secondary virtual volume (e.g. see column 11, lines 58-62);

As per claim 19, wherein the access request is redirected in response to a command to redirect the access request to the second secondary virtual volume (e.g. see column 11, lines 52-58);

As per claim 20, the different media types of the physical volumes associated with the virtual/logical volumes is taught by Lecrone since Lecrone clearly discloses data storage facilities 204 and 207 can have many different forms (e.g. see column 4, lines 38-39);

Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be

Serial Number: 10/033,925

Art Unit: 2186

negatived by the manner in which the invention was made.

6. Claims 10-11 and 21-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeCrone et al. (USPN: 6,874,046); hereinafter LeCrone; in view of Schumacher (USPN: 6,735,765);

As per claims 10-11 and 21-22, LeCrone discloses the invention as claimed, detailed above with respect to claims 1-9 and 12-20; LeCrone however does not particularly teach converting the access request to a format suitable for the second media type from the first communication protocol to a second communication protocol. Schumacher, in his teaching of sharing data between operating system having multiples virtual volumes wherein the first and second virtual volumes maps data stored in the disk array by extracting data from the first virtual volume in the first format and converting to the second format to transfer/copy to the second virtual volume which is compatible with the second data processing system (e.g. abstract; column 12, lines 10-24). According, it would having been obvious to one having ordinary skill in the art at the time the current invention was made to implement the format conversion process amongst different virtual volumes as taught by Schumacher that is known to be required in the system of LeCrone in order to arrive at Applicant's current invention. In doing so, it would allow the data to be correctly read and executed amongst different stations or virtual volumn units, thereby enhancing system reliability, system data

Serial Number: 10/033,925

Art Unit: 2186

coherency, therefore being advantageous.

7. Claims 23-31 are rejected under 35 U.S.C. 103(a) as being unpatentable over LeCrone et al. (USPN: 6,874,046); hereinafter LeCrone.

As per claims 23-31, LeCrone discloses the invention as claimed, detailed above with respect to claims 1-9 and 12-20; LeCrone however does not particularly disclose a computer-readable medium of instructions to be implemented on a computer as being claimed in claims 23-33. However, one of ordinary skill in the art would have recognized that computer readable medium (i.e., floppy, cd-rom, etc.) carrying computer-executable instructions for implementing a method, because it would facilitate the transporting and installing of the method on other systems, is generally well-known in the art. For example, a copy of the Microsoft Windows operating system can be found on a CD-ROM from which Windows can be installed onto other systems, which is a lot easier than running a long cable or hand typing the software onto another system. The examiner takes Official Notice of this teaching. Therefore, it would have been obvious to put LeCrone's program on a computer readable medium, because it would facilitate the transporting, installing and implementing of LeCrone's program on other systems.

8. Claims 32-33 are rejected under 35 U.S.C. 103(a) as being

Serial Number: 10/033,925

Art Unit: 2186

unpatentable over LeCrone et al. (USPN: 6,874,046); hereinafter LeCrone; in view of Schumacher (USPN: 6,735,765);

As per claims 32 and 33, the combination of LeCrone and Schumacher disclose the invention as claimed, detailed above with respect to claims 10-11 and 21-22 (also see claims 23-31); the combination of LeCrone and Schumacher however do not particularly disclose a computer-readable medium of instructions to be implemented on a computer as being claimed in claims 32 and 33. However, one of ordinary skill in the art would have recognized that computer readable medium (i.e., floppy, cd-rom, etc.) carrying computer-executable instructions for implementing a method, because it would facilitate the transporting and installing of the method on other systems, is generally well-known in the art. For example, a copy of the Microsoft Windows operating system can be found on a CD-ROM from which Windows can be installed onto other systems, which is a lot easier than running a long cable or hand typing the software onto another system. The examiner takes Official Notice of this teaching. Therefore, it would have been obvious to put LeCrone and Schumacher's program on a computer readable medium, because it would facilitate the transporting, installing and implementing of LeCrone and Schumacher's program on other systems.

Serial Number: 10/033,925

Art Unit: 2186

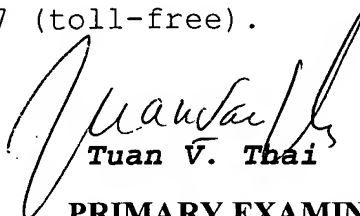
Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuan V. Thai whose telephone number is (571)-272-41287. The examiner can normally be reached from 6:30 A.M. to 4:00 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mathew M. Kim can be reached on (571)-272-4182. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVT/April 15, 2005


Tuan V. Thai

PRIMARY EXAMINER

Group 2100